

Calculating the True Costs of Pest Control



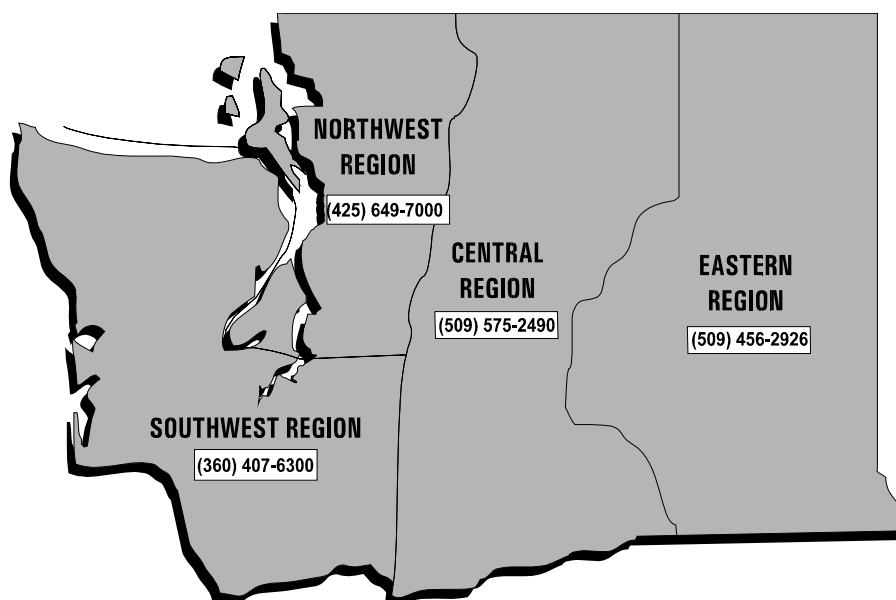
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Why You Want to Read This Guide

This guide provides a simple method to help schools and other businesses estimate and compare the total costs of a conventional pest management program with the costs of an Integrated Pest Management (IPM) Program. Instead of routinely spraying pesticides, IPM employs monitoring to determine the location, extent, and the cause of a weed or pest problem and then applies a variety of non-chemical or least-toxic pesticide controls. IPM strategies are more effective because they are better able to prevent pest problems. This is because they focus more on modifying the cause of the problem, instead of just spraying the pest after it becomes a problem. IPM is the equivalent of a wellness program to maintain the facility and landscape in a healthy condition; to avoid the need for “prescription” chemical treatment, and the costly side effects that can be associated with them. Pesticides are used only after other options have been fully considered and only if other methods have not reduced pests to a tolerable level. Determination of this tolerance level is based on pest-specific and site-specific criteria.




Goal of Integrated Pest Management

The goal of IPM is to manage pests effectively and economically while protecting people and the environment.

Advantages of Integrated Pest Management

The business advantages of an IPM program for building and landscape management are well documented, but not well publicized. This summary describes results of studies that show the positive impact of IPM in public urban settings, including schools. The studies cited show that an IPM program has many business advantages over a conventional pesticide spray program.





applying IPM in 30 million square feet of federal buildings since 1988. They use less than two percent of the sprayed liquid insecticide that was routinely used before starting their IPM program. At the same time, pest problems have generally declined, occupant satisfaction increased, and citizen reaction to the environmental improvements has been overwhelmingly positive. GSA's program is a conclusive demonstration that structural IPM works, that it can be pragmatic, economical and effective on a massive scale.(1)



Direct Cost Savings

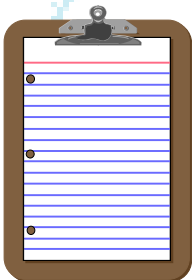
Montgomery County Public Schools in Maryland produced cost savings and got better pest control when it shifted from a traditional spray program to IPM for its buildings and landscapes. A crude comparison of labor, equipment and materials costs showed savings ranging from 15 to 18 percent per year over a six year period. Pest control costs were reduced by \$111,000 over the study period. The district saved \$1,800 at each school and \$30,000 at its food service warehouse. Reduction of pesticide use by 90 percent and use of least toxic pesticides when pesticides are required have made school and work safer for 110,000 students and 12,000 employees. (2,3,4,5)

Anne Arundel County school district in Maryland, implemented IPM and cut its pest control budget from \$46,000 to \$14,000 in its first year.(3)

Cost Effectiveness of Monitoring

In an IPM program, on-going monitoring is used to determine if, when and where pest populations are high enough to warrant action. There is a common perception that labor costs of monitoring put an IPM program at an economic disadvantage to a conventional program. In reality, studies show that savings from decreased use of pesticides and the longer-term effectiveness of IPM offset the higher labor costs of monitoring.

IPM approaches are usually more cost effective because they are more systematic and strategic than traditional spray programs. For example, by monitoring 1100 elm trees rather than automatically



spraying them for elm leaf beetles, the City of San Rafael, California found that only a small portion of the trees needed to be sprayed. The city saved \$1400 over the previous year (including monitoring costs) in the first year of its IPM program. (6)

The University of Maryland and Montgomery Village, Maryland cut costs and pesticide use while caring for the community's street trees. Students examined the trees and learned that much of the damage previously thought to be pest damage was actually caused by poor tree care. Replacing cover sprays with a program of soil improvement, pruning, and monitoring saved the community 22 percent. (7)

The preventive approach of IPM reduces the overall need and cost for pest control. Furthermore, treatments that are carefully timed and targeted based on monitoring of the pest population level are usually more effective and last longer than those based on a pre-scheduled plan. Savings can be applied to additional investments in preventive maintenance or to deferred maintenance needs. This can lead to additional improvements in the appearance and quality of the facility and landscape with no extra cost.

Eliminating the Source of Pest Problems

IPM methods identify and reduce the source of pest problems. The preventive approach is more cost effective than a program of spraying that does not address the cause of the problem and so must be repeated again and again. The National Park Service permanently reduced rat populations in certain parks by reducing rat habitats. This was done by blocking rat entrances with concrete, changing the design of garbage cans, and increasing frequency of garbage pick-up. Rodenticides are now only a secondary tool. Previous control programs that relied on poison baits had not been successful despite large expenses of money and labor. (8)





Improving Facility and Landscape Quality

IPM not only provides cost savings but also improves facility conditions and landscape quality. Following a two year IPM study in Maryland, a survey showed that 81 percent felt the appearance of the trees improved as a result of the IPM program. Only five percent did not feel plant appearance improved. (14 percent were unsure.) Eighty-four percent preferred using alternative controls to traditional cover sprays. (7)

For the past twenty-five years, the University of California at Berkeley has been developing and implementing IPM services with a goal to prevent recurrence of pest problems. The campus has a daily population of 53,000 who use 4,200 apartments, 24 commercial food service facilities, 9 child care centers, 6 museums, 300 animal rooms, and 3,000 laboratories, housed in 632 structures which enclose 14.12 million square feet. UCB IPM uses vacuums and other sanitation measures, structural modifications, traps, biocontrols, baits, and growth regulators to greatly reduce pest problems while almost eliminating use of liquid sprays. Cockroach reports have been reduced by 98 percent in housing and by even more elsewhere (1-2 reports per month from the central campus). The program operates effectively with three technicians and one manager. (9)

The City of Santa Monica, California adopted an IPM program for maintenance of their public grounds and buildings. An evaluation of the program found several successes. Some employee comments included: "[I] used to call for spraying [and] normally the problem would return. [IPM] methods are more effective, [there is] less trouble with pests returning." IPM also reduced the number of complaints by facility managers, *and reduced the cost of pest control services by 30 percent.* (10)

Business advantages of IPM programs over conventional pesticide spray programs thus include:

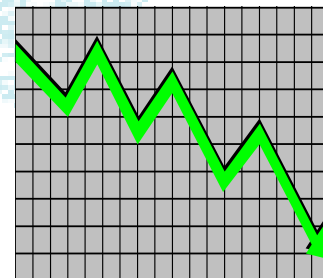
- ⌘ Reduced cost of pest control programs.
- ⌘ Maintained or improved landscape quality.
- ⌘ Improved client and/or patron satisfaction.
- ⌘ More effective pest control.
- ⌘ More control in decision-making and problem-solving so that decisions are deliberate rather than reactive.
- ⌘ Risk-reduction benefits that result from using fewer and lower-risk pesticides.
- ⌘ Improved targeting of pesticide applications so that chemicals are used only when and where necessary to avoid negative impacts on people and the environment.

Reducing Contingent Costs

There are a number of factors to consider when deciding whether to use IPM or routine spraying. When the decision must be based on economics, it is important to include all costs in the analysis.

Traditional cost analyses often consider direct capital and operating costs yet commonly overlook indirect oversight/administrative and other costs. These costs are often perceived as unavoidable overhead. Additionally, there are many contingent costs that are difficult to quantify, such as future liability, public relations, and occupational insurance.

Pesticide usage increases the risk and costs of occupational injuries and illness. In landscape pest management businesses in Washington State, chemically-related injuries represented more than six percent of all claims filed from 1991 through 1995. (11) Chemically-related insurance claims for Washington State businesses performing structural pest control (in buildings) represented 12 percent of all injury claims from 1991 through 1995. (11)



In California, a twelve-person medical clinic/hospital wing had to be closed for a day due to odor and health concerns following an insecticide application. It cost \$500,000 to settle the insurance claim. (12)

By reducing pesticide exposure and risk, IPM operations may result in reduced insurance claims and costs. Typically, about two to three percent of a business's receipts are spent on liability insurance protection. When higher risk activities lead to claims, insurance premiums often double or triple. (12) Some insurance companies offer premium discounts for activities that reduce pesticide risks. The North Pointe Insurance Company of Michigan has lowered premiums by as much as 20 percent to farmers who participate in a local environmental stewardship program. The program rewards "preventive insurance" activities that reduce pesticide and other risks. The features of the insurance discount program for farms acknowledges the "hidden" costs and risks of conventional spray programs. The same risks and hidden costs pertain to spray programs in schools or businesses – hence the savings that "preventive insurance" efforts produce for farms are equally relevant to schools and businesses.



Determine the Cost Effectiveness of Your Pest Management Program

Table 1 on page 7 lists tangible costs. These include common start-up, operating, and contingent expenses for pest management activities that should be included in a total cost analysis. Your pest management operation may have different or additional activities. Identify those activities and their estimated costs to include in your analysis. Table 1 also lists information sources to help assess each cost.

To compare costs of a conventional and an IPM program, identify all essential activities and their costs. There are often hidden general cost categories, like "overhead," "administrative" and "legal." Linking such costs with specific options makes it possible to compare costs accurately.

Table 1

Relevant Activities and Equipment	Total Cost	Information Source
Start Up Costs		
Equipment Spray vehicles Sprayers <ul style="list-style-type: none"> • Motorized • Back-pack • Other Spill-response equipment Safety equipment (personal protective equipment) Vehicle operation and maintenance Spray equipment maintenance		Business Mgr or Accounts Payable Clerk Business Mgr or Accounts Payable Clerk Business/Risk Mgr or Accounts Payable Clerk Maintenance Program, Business or Risk Mgr Business, Risk or Maintenance Program Mgr Operations Mgr, Business Mgr Operations Mgr, Business Mgr
Buildings/Structures Storage area construction <ul style="list-style-type: none"> • Pre-design studies • Permits • Engineering and construction costs Mix-load operational area containment		Business or Risk Mgr or Accounts Payable Clerk Business or Risk Mgr
Supplies Pest control materials, products		Maintenance Program or Business Mgr
Insurance Liability insurance differential for pesticide activity Occupational insurance cost differential for chemical handlers		Business or Risk Mgr Business or Risk Mgr
Training Staff training and pesticide licensing costs Safety training for hazardous materials Ongoing and annual training costs Parent-teacher group training		Business or Risk or Maintenance Program Mgr Operations or Risk Mgr Operations or Risk Mgr
Payroll Receiving, inspection, storage cost of pesticides and pest control materials Salaries and wages		Operations or Business Mgr Operations or Business Mgr
Quality Protection Pesticide licensing costs		Operations or Business Mgr
Contracts Pest management outsourcing expenses Hazardous waste management and disposal costs		Operations or Business Mgr Operations or Business Mgr
Oversight/Administrative Costs Training and development oversight Pesticide spray recordkeeping Regulatory compliance oversight <ul style="list-style-type: none"> • OSHA • WISHA • WSDA • Ecology Spill Reporting, etc. • Recordkeeping/reporting, government liaison, etc. Medical surveillance of workers' exposure Notification/relations with site occupants/patrons		Operations or Risk Mgr Operations or Risk Mgr Operations or Risk Mgr Risk or Operations Mgr Public Affairs or Risk or Operations Mgr
Contingent Costs Employee safety/absenteeism-illness Safety/absenteeism of building/site occupants Public relations, community fear of pesticides Legal fees for accidents, spills patron complaints and litigation Environmental consulting fees for liability concerns: spills, cleanup, hazardous materials management and disposal		Interview employees, payroll records Interview employees, attendance records Interview Public Affairs Office, survey patrons Interview Legal Department Interview Legal and Accounts Payable Depts

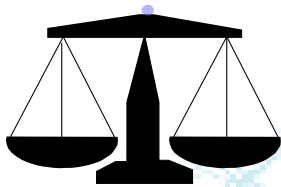
For example, pesticide spraying may require extensive and expensive record keeping. To compare a routine spray program with IPM, the portion of total record keeping costs resulting from pesticide use needs to be identified.

Allocating Expenses to the Correct Cost Category



Expenses must be allocated to their correct cost categories for comparisons to be fair and genuine. Some costs attributed to an IPM program may in fact be waste management, maintenance, or equipment purchase costs that replace or extend sums previously budgeted under other costs categories. For example, under a conventional program the price of purchasing kitchen cleaning equipment or a new turf aerator would not usually come from a pest control budget. If these items are replaced specifically to prevent pest problems, and because of a recommendation from an IPM coordinator or contractor, the costs might be unfairly transferred to the "Pest Management" budget. If costs serve needs other than pest control, percentages of these costs should be allocated proportionately. This allocation should be made for both operating costs and capital investments.

Allocating Capital Expenses Fairly



Direct pest control costs are primarily for routine operating expenses. However, IPM sometimes require larger one-time costs, such as permanent structural modifications for pest exclusion, turf renovation, or landscape weed barriers. If such an investment only serves the pest control program, its cost should be amortized over its lifetime. In fact, many one-time expenses will generate cost-savings in future years.(13)

The Cost of Risk and Future Liability

To assess the true cost of your operation, determine known tangible costs as well as potential costs associated with future pesticide risks. Although the cost of future risk and liability cannot be quantified, at least the relative risks of IPM and conventional approaches can be compared.



An IPM program is often shown to be more cost effective than a conventional program by comparing only the known start-up, operating, oversight/administrative and contingent costs. In the case where the cost difference alone does not favor IPM, it is especially important to compare risks.

The following tables provide a list of risk factors to include in your cost analysis. The tables will help you estimate relative risks (i.e., subjective costs) of your current pest control methods. To calculate a relative risk score for your program, first work tables 2A through 2D, (pages 10-15). Then enter your scores onto Table 2 below to calculate a total relative risk score for your pest control program.

Table 2 Comparing Relative Risks of Pesticide Activities	
Enter total risk scores from Tables 2A-2D, based on current pest management practices.	
Table	Risk Score
Table 2A Potential Liability for Health Effects (workers, occupants, patrons)	
Table 2B Accidents or Spills	
Table 2C Potential Liability for Property Contamination (personal injury, resource or property damage, escalating cost of insurance, fines and settlement fees, litigation, site cleanup)	
Table 2D Potential Liability for Compliance Violations	
Total Score of All Tables	

IPM strategies typically provide tangible cost-savings as well as longer-term advantages, such as:

-  *Reduced long-term liability resulting from responsible and safe pesticide storage, use, containment and disposal;*
-  *Improved public image as an environmentally responsible organization;*
-  *Improved employee health and safety;*
-  *Enhanced community relationship;*
-  *Fewer regulatory headaches.*

Table 2A: Potential Liability for Health Effects

(Risk Score 1 = Low, 4 = Medium, 9 = High)

1. Frequency of Pesticide Use

- r* Pesticides are used rarely and only as a method of last resort when other options won't meet pre-determined management objectives. (Score = 1)
- r* Pesticides are often applied as preferred method of pest management. (Score = 4)
- r* Pesticides are almost always the method of choice. (Score = 9)
- r* Pesticide use occurs only when monitoring reveals that the pest population exceeds pre-determined tolerance levels. (Score = 1)
- r* Pesticides are applied according to a calendar schedule without assessing the need for treatment. (Score = 9)

Score _____

2. Notification

- r* Building/Site occupants are notified before and after pesticide use (announcements or signage), to alert them of potential health risks. (Score = 1)
- r* Occupants usually notified. (Score = 2)
- r* Occupants sometimes notified. (Score = 3)
- r* The school does not have a policy for notification of spraying activities. (Score = 9)

Score _____



3. Building/Site Occupancy

- r* Volatile pesticides are never applied. (Score = 1)
- r* When pesticide dust or sprays are applied, the building/site is unoccupied. (Score = 4)
- r* When pesticide dust or sprays are applied, the building/site is sometimes or usually occupied. (Score = 9)

Score _____

4. Toxicity and Non-Target Impact of Pesticides Used

- r* When pesticides are used, they are always non-volatile compounds in baits or otherwise inaccessible to people (i.e., in sealed wall voids or sealed crevices). (Score = 1)
- r* When pesticides are used, they are usually non-volatile compounds in baits or otherwise inaccessible to people. (Score = 4)
- r* When pesticides are used, moderate to higher toxicity materials are chosen. (Score = 6)
- r* When pesticides are used, higher toxicity materials are usually chosen. (Score = 9)

Score _____

5. Applicator Training and Safety

- r* Pesticide workers are thoroughly trained about pesticide safety (minimum 8 hours per year). (Score = 1)
- r* Pesticide workers receive approximately 4-7 hours of pesticide safety training each year. (Score = 4)
- r* Pesticide workers receive less than 4 hours formal training each year. (Score = 9)
- r* Pesticide workers always use necessary personal protective equipment. (Score = 1)
- r* Pesticide workers usually use necessary personal protective equipment. (Score = 3)
- r* Pesticide workers sometimes use necessary personal protective equipment. (Score = 6)

- r* Pesticide workers rarely use necessary personal protective equipment. (Score = 9)
- r* Pesticide workers participate in an ongoing medical surveillance program. (Score = 1)
- r* Pesticide workers who apply pesticides other than in non-volatile baits do not participate in an ongoing medical surveillance program. (Score = 9)

Score _____

Total (sum of categories 1 - 5) Score _____

Total Score for Table 2A Score _____

(Enter score here and in the 2A row of Table 2 on page 9)

Table 2B Accidents or Spills

(Risk Score 1 = Low, 4 = Medium, 9 = High)

1. Emergency Planning - Preparedness

- r* An emergency preparedness/response plan is in place, and it is posted at the pesticide storage/handling areas. (Score = 1)
- r* A plan is in place, but it is not posted. (Score = 4)
- r* No emergency preparedness/response plan has been prepared. (Score = 9)
- r* If there is a plan, all employees are familiar with it. They *are pre-trained* and are confident they can accomplish their role. (Score = 1)
- r* If there is a plan, only some employees are familiar with and trained regarding their role in the plan. (Score = 4)
- r* There is an emergency preparedness/response plan but employees are not properly trained about it. (Score = 9)
- r* If there is a plan, Local Emergency Response Services are familiar with it. They have recently observed the property and pesticide inventory to enhance response capabilities. (Score = 1)
- r* There is an emergency plan but Local Emergency Response Services are not acquainted with it. (Score = 4)

Score _____

2. Response Equipment and Materials

- r* Pesticide Storage and Handling areas are equipped with spill response supplies (personal protective equipment, absorbent material, containers, plastic bags, brooms, shovels, vacuum, etc.). (Score = 1)
- r* Spill response supplies are not available at pesticide storage and handling locations. (Score = 9)
- r* Spill response supplies are available at the pesticide application site. (Score = 1)
- r* Spill response supplies are not available at the pesticide application site. (Score = 9)
- r* Pesticide handlers and potential spill responders are properly trained about safe and effective use of personal protective equipment (e.g., fit-tested for respirator use, etc.). (Score = 1)
- r* Pesticide handlers and potential spill responders are not adequately trained about safe and effective use of personal protective equipment.

Score _____

Total Score for Table 2B Score _____
(Enter score here and in the 2B row of Table 2 on page 9)

Table 2C Potential Liability for Property Contamination

(Risk Score 1 = Low, 4 = Medium, 9 = High)

1. Risk of Spills, Environmental Releases

- r* No liquid or dust pesticides are ever used. (Score = 1)
- r* If liquid or dust formulations are used, they are typically applied using small-quantity manually powered sprayers/devices (5 gallon tank mix or less). (Score = 4)
- r* Liquid or dust formulations are applied using larger-quantity mechanically powered sprayers (over 5 gallons tank mix). (Score = 6)

- r* The pesticide storage area is built or equipped to contain any leaks or spills, preventing an environmental release. (Score = 1)
- r* There are no provisions in the pesticide storage area to catch and contain spills. (Score = 9)

Score _____

2. Loss and Damage Control

- r* Pesticide storage area has temperature and moisture controls to keep product from becoming damaged or leaking. (Score = 1)
- r* Product storage area has no damage prevention features. (Score = 9)
- r* Product inventory controls ensure materials are used in a timely manner, so they don't become outdated or unusable, carrying associated risks of hazardous waste management. (Score = 1)
- r* Product may become outdated or unusable, possibly regulated hazardous waste because inventory controls are lacking. (Score = 9)

Score _____

Total Score for Table 2C Score _____
(Enter score here and in the 2C row of Table 2 on page 9)

Table 2D Potential Liability for Compliance Violations

Even the most carefully planned and well-intended spray program is at risk of human error. Pesticide handling operations are quite actively regulated by a number of agencies. Check the box next to each statute that applies to your pest management program. Add up the number of checks and write the number on the line at the bottom of the page.


- 
- r* Pesticide Application Act
 - r* Pesticide Control Act
- } *These Legislative Statutes provide for regulation of safe handling, distribution, transport, use and disposal of pesticides.*
- r* General Pesticide Regulations
 - n* Licensing of staff and equipment
 - n* Recordkeeping
 - n* Staff training
 - n* Notification of sensitive individuals
 - n* Containment-prevention of environmental releases
 - r* Occupational Safety and Health
 - n* Worker protection
 - n* Personal protective equipment
 - n* Staff safety training
 - r* Hazardous Waste Management
 - n* Waste designation, packaging, manifesting, disposal
 - n* Notification, recordkeeping and annual reporting
 - n* Spill reporting and cleanup
 - r* Site Cleanup
 - n* Environmental Site Assessment
 - n* Site characterization
 - n* Sampling/analysis of soil, groundwater
 - n* Contaminated media removal or treatment
 - n* Disposal of contamination

Table 2D Total **Score** _____

(Enter score here and in the 2D row of Table 2 on page 9)

Now that you have entered the scores from Tables 2A through 2D onto Table 2, calculate the total score for all tables (bottom of Table 2). Programs with a total score below 25 would have a ***lower risk*** rating. Programs scoring between 26 and 55 could be classified as ***moderate risk***, and those with a score higher than 55 would be described as ***high risk***. You can reduce the program risk by switching to IPM methods.



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